

# Sultana:

GOOD PRACTICES AND OTHER CURIOSITIES



Slow Food®  
BOLIVIA

# SULTANA: GOOD PRACTICES AND OTHER CURIOSITIES

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# *Sultana:*

GOOD PRACTICES AND OTHER CURIOSITIES

## PRESENTATION

This work is the result of a partnership between the SNIS Project (Swiss Network for International Studies) and the Slow Food Bolivia movement, as part of the project for **Improving Rural Livelihoods through the Promoting High-quality Coffee and Coffee Cherry Products in Colombia and Bolivia.**

Slow Food is a worldwide movement that proposes a new food system based on good, fair and clean food; organizing various activities and campaigns, to spread this message around the world.

Slow Food has been present in Bolivia, a mega-diverse country with a diversity of flora and fauna and therefore rich agro-biodiversity, for six years now, despite the fact that globalization has eroded urban and rural consumption patterns.

This situation within Bolivia has led Slow Food Bolivia to focus its activities on preserving knowledge and flavors from the diverse regions of the country. This is an important mission that should be supported in order to bring products from the past into the present and to create sensory experiences that will connect current and future generations.

This practice of rescuing food diversity and traditions has saved a wide range of products across several regions. The purpose of this publication is to share the process of creating value from dried coffee cherries, known in Bolivia as sultana, which have been traditionally used by the Yungueño people and are gaining some popularity, with families in La Paz. It is time to break the myths about sultana and expand its presence in the market by improving its quality and sharing local knowledge.





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## 1. HISTORY



Fuente: [www.coffetour.com](http://www.coffetour.com)

It is believed that coffee originated in Ethiopia, and that it was brought to Latin America by the French during colonization. Nowadays, Brazil is the most important coffee producer in the world, while Bolivia produces less than 1% of the world's coffee. However, Bolivian coffee is known for its high quality and provides an income for up to 17,000 bolivian producer families and to 12,000 families that are involved throughout the different stages of the coffee value chain.<sup>2</sup>

The earliest information about coffee plantations in Bolivia dates back to the beginning of the XIX century. There was very little production and the coffee was destined exclusively for private consumption. However, little by little the cultivation of coffee increased and its popularity grew<sup>3</sup>.

At that time, coffee was of interest to landowners and employers, since its consumption was considered luxurious. The Yanaconas (domestic servants or rural workers in the service of the landowners) were not allowed to drink coffee<sup>3</sup>.

There is no information about when the cascara (dried coffee cherry skins) started to be consumed as a tea, known as Sultana. However, it is widely known that it was formerly considered to be “the tea of the poor”. It is very likely that the Yanaconas began to use dried coffee cherries during the early period of coffee production in Bolivia, since it was what was available to them. It thus became a characteristic Yungas drink, that was just drank by the local farmers, while coffee was reserved for elite groups.





Coffee growing started to increase in the 1950s, influenced by the growing coca market, the crisis of other production sectors and the agrarian reform that brought the landlord regime to an end, resulting in the Yungas peasants obtaining their own land to grow crops.

Sultana was mainly consumed by the Yungas peasants and was, for a long time, considered to be a drink of the poor, it did not represent any economic value and its production was only for family consumption.

Little by little, sultana became better known and many migrant families from the yungas took this tradition to the city of La Paz, where it is more well-known

than in any other cities in Bolivia, making it part of the identity of the city.

Many people have tried or know of the sultana, and several coffee producers who sell sultana say that people consume it because of the benefits that their grandparents told them it possesses, such as blood pressure regulation.

As the culture of coffee has grown in the city of La Paz, sultana has also begun to gain more attention for its exquisite flavor and its benefits. Baristas and chefs are also using sultana as an interesting ingredient for their creations.



TRADITIONAL SULTANA



SULTANA ICE CREAM



ICED SULTANA



SULTANA PANCAKES

## 2. A DILEMMA AND A CHANCE

Coffee is one of the most commercialized products in the world and therefore responsible for the generation of large amounts of waste<sup>4</sup>. The same characteristics that make sultana a good nutritional supplement (caffeine, tannins, and phenolic compounds, among others) are harmful to the environment when it is disposed of in the soil without pre-processing, mainly due to the rapid fermentation of its sugars<sup>5-6</sup>. This issue is often mentioned by coffee farmers, who say that *When you dispose of the cascara in the plantation in large quantities, it will damage plants that come into in contact with it.*

In Bolivia, the production of coffee provides an important income for producer families that mainly come from the Yungas region. Sadly, since the 1990s, the coffee growing sector has been in a crisis, as a result of low national and international prices. Additional income could be generated from coffee production by the comercialization of the dried husk – sultana. However, production is still small-scale, due to low prices and frequent mold problems during the drying process. Even though there is a growing sultana culture in La Paz, demand is still relatively low compared to the demand for coffee.



FRESH COFFEE CASCARA AND SULTANA



COFFEE CHERRIES



Using sultana for human consumption would help to reduce this waste that can be very harmful for the environment if it is not treated properly (when large quantities are disposed of near water bodies or on the ground). Furthermore, it could also provide extra income for coffee producer families.

Sultana is not only consumed as a traditional tea, but can also be used in a wide range of foods in the gastronomy industry. Therefore, this manual and the recipe book are just one of many ways we can help increase the value of sultana by promoting it as a very traditional Yungas product that has also become part of the identity of the city of La Paz.

### 3. DIFFICULTIES IN THE PRODUCTION OF SULTANA

Because farmers depend on the sun to dry the sultana, they are vulnerable to poor weather conditions. The cascara is very delicate and tends to contract fungus quickly. This usually happens when there are cloudy or rainy days during the drying process.

portion for sultana production. They prefer to use the drying space for coffee beans and not for sultana, due to its lower price and the difficulty of drying it. Farmers prefer to use most of the fresh cascara for fertilizer, or to simply discard it.

The amount of sultana that could be produced is proportional to the amount of coffee beans. However, many families who dry the cascara only use a small



SULTANA DRYING UNDER THE SUN



## 4. GOOD PRACTICES

High sultana quality is the result of efficient management of the coffee growing process and gentle treatment of the cascara. This basic coffee growing process starts with the germination in the seedbeds, then goes to plantation, the management of the coffee plantation, continues with the post harvesting, and ends with the drying and roasting. Following all of these good practices influences the quality of the sultana, making it more competitive in the national market. In this way, a culture of quality in both the production process and consumption can be achieved. Furthermore, good practices can promote the sustainable development of agriculture by minimizing the negative impact that the production process causes in the environment.

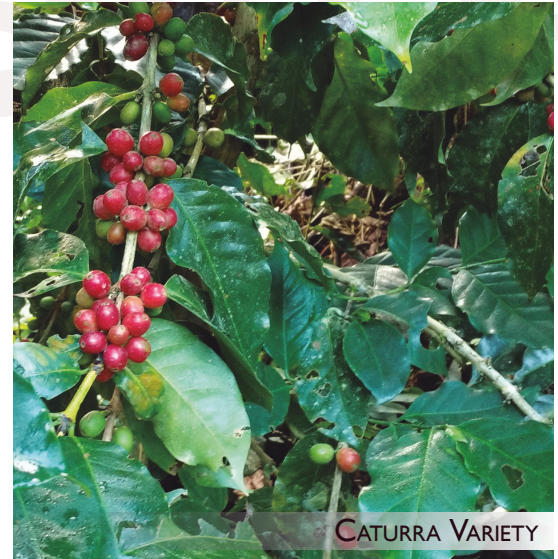
Sultana production is closely connected to coffee production. Therefore, producing high quality coffee is likely to deliver high quality sultana. Soil characteristics, altitude, temperature, exposure to the sun and the ripening of the fruit all influence the probability of obtaining good quality sultana. However, this is not always the case, and some issues can be seen in how the product is handled at the harvesting stage, mainly due to the cost-benefit that this product provides to producer families.



## 4.1 SELECTION OF COFFEE VARIETIES

The two most consumed coffee varieties in the world are arabica coffee (*Coffea arabica*) and robusta coffee (*Coffea canephora*)<sup>7</sup>. The variety that is produced most in Bolivia is arabica coffee since it can grow between 800 - 2000 meters above sea level. The varieties that are most commonly grown are: Typica Criolla, Red and Yellow Caturra and Catuai, Mundo Novo and Catimor, and in recent years Castillo and Geisha.

Given that the sultana market is only just becoming established and increasingly known in specialty coffee shops, separation by variety is still not common due to the lack of demand. However, just as differences are found in coffee according to variety, the same sensory and compositional differences can also be found in sultana<sup>9</sup>, making it a potential product for bartenders and tasting.





## 4.2 GERMINATION AND SEEDBEDS FOR THE COFFEE PLANT

Germination of the seeds can be performed in two ways, either directly in the potting soil or in germinators with clean sand and water.

Both are equally effective, however, germination in sand and water will help prevent the roots from adhering to a substrate and from breaking when removed. The germination process takes approximately one month, then each seedling is placed in small planting bags with substrate and taken to a shaded area - El Almácigo - where they are frequently watered and periodically monitored.

The potting soil can be a mixture of compost, properly sifted local soil. It is also recommended to include a little sand in the mixture to achieve better moisture distribution. At altitudes below 1,200 m, the seedlings are put into the seedbeds for approximately six months, whereas at higher altitudes they are put into the seedbeds for up to a year, since the development of the seedling is usually slower.



At altitudes above 1,500 m, some farmers have mentioned a problem that occurs in the seedbed phase, called damping off or bad-neck disease, which is caused by pathogenic fungi in the soil. These fungi cause radical rot, identified by a dark color in the roots or in the neck of the root. This problem seems to be more common at these altitudes due to the humidity. It is recommended that any affected individuals are amicably separated and if possible all healthy, non -infected seedlings are moved apart to protect them, since this fungus easily spreads.



SEEDLING AFFECTED BY THE DAMPING-OFF FUNGUS



EXTREME ROT CAUSED BY FUNGUS



### 4.3 TRANSPLANTION TO THE FIELD

After six months or a year, it is important to transplant of the seedlings to places with a bit of shade, for instance, from timber plants. It takes aproximately two years for the seedlings to grow and develop, before they flower for the first time and later form fruits that will go on to ripen. At altitudes, the first flowering often occurs when the plants have reached their third year.





## 4.4 COFFEE PLANT MANAGEMENT

The coffee plant needs to be cultivated in an agroforestry system, an association between tree species that provide shade: for instance timber trees and fruit trees (such as citrus and banana trees). This traditional cultivation system makes it possible to use the space in an optimal and efficient way, diversifying the cultivation in different strata of plants. This avoids further disturbance of the ecosystem and contributes to maintaining the ecosystem services that the agroforestry systems provide, such as: maintaining the natural exchange in the trophic chain; retaining moisture in soils; recycling nutrients through the plant litter that is produced, decomposed and ultimately generates organic matter, something that is also associated with the diversity of the local biome; protecting the soil from erosion; and generating an optimal microclimate for the coffee plants.





The cultivation of coffee in an agroforestry system also helps to reduce pests, since there are other crop types that a pest or disease cannot infest. Such systems also host a diverse bird community, which increases predation of caterpillars that are often the cause of damage to leaves and fruit. Farmers have traditionally used agroforestry systems in the Yungas, and several continue to do so. However, in ewxwnr years another form of cultivation has emerged, the conventional system of monoculture that creates many complications for the environment, such as deforestation, loss of biodiversity, soil erosion and the use of toxic chemicals.

If the coffee plants are infected with some type of fungus or another pest (most commonly : Broca, Roya or Ojo de gallo), it is recommended to prune the plant or cut it down to prevent any spread. The application of biopesticides is often difficult for the farmers, because they are expensive and, due to the size of the coffee plantations, take a long time to apply.



MONOCULTURE



OJO DE GALLO

## 4.5 HARVESTING

The ripe coffee fruits can be identified by their color; they should be dark red or yellow, depending on the variety, and are called “guindas” in the Yungas of La Paz. The coffee harvesting season varies depending on the location. At higher altitudes, ripening and harvesting are gradual and slow. Some cherries can be picked as early as March, but they must be harvested gradually as they ripen.

Higher altitudes result in a slower ripening due to the lower temperatures<sup>20-21</sup>, usually making the harvest very long, starting in March and ending in August, or even September. However, most of the coffee is harvested between the months of June and July. As a result, harvesting at altitude it is usually harder.

Because the coffee cherries ripen gradually at altitude, they have more time to develop more complex flavors. The production of sugars in the pulp increases and they become more acidic. The higher the altitude of the coffee plantation, the higher the percentage of acids, antioxidants, sucrose and caffeine<sup>20-21</sup> present in the coffee bean. A plantation is considered to be high altitude if it is anywhere between 1,200 and 2,000 m.



GRADUAL RIPENING IN ALTITUDE



Coffee plantations at lower altitudes tend to ripen almost all at the same time, between the months of April and May, while the coffee plantations at medium altitudes ripen between May and June.





## 4.6 POST HARVESTING

Once the coffee cherries have been harvested they go through a selection process, where the best cherries are selected according to the buoyancy. The good cherries sink to the bottom of the container and the low quality ones (affected by the coffee berry borer, that are green or haven't developed properly) generally float. These must be discarded, not be used in either the production of coffee or sultana. Once the flotation process has been completed, the good fruits are washed again and pulping process continues (the separation of the peel and the coffee bean). The bean is used for coffee production and the shell for the production of sultana.



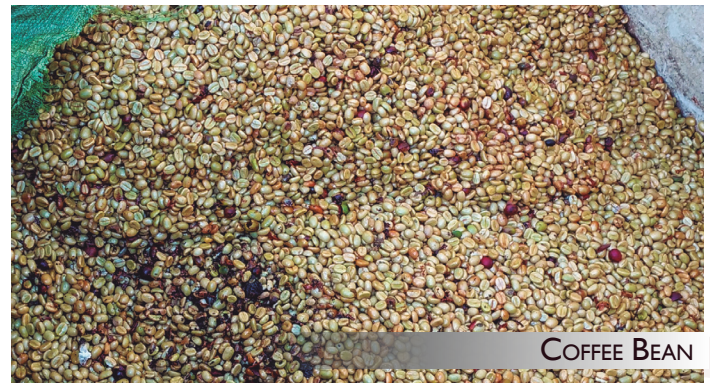
WOODEN TRAY AND CEMENT SWIMMING POOL FOR BUOYING



ELECTRIC PULPER MACHINE



CASCARA



COFFEE BEAN

## 4.7 DRYING OF THE SULTANA

The traditional drying process that the Yungas farmers use, is to lay the sultana directly onto plastic sheets spread on the ground, thus exposing them to the sun. However, on days without much sun, the use of plastics will cause the sultana to ferment very quickly or to become moldy, meaning they have to be discarded.

A better method of drying the cascara than on plastic sheets is to use drying platforms with nets that approximately one meter high. These nets help improve aeration, thus reducing the risk of mucilage fermentation and also reducing further contamination from dust, animal hairs, feather, feces, etc.

Drying can be performed directly in the sun and takes around 3 to 4 days, depending on the weather and how well-spread out the cascara are. It is recommended to have a closed area specifically for drying, with windows for good ventilation, since this helps prevent contamination.

Once the sultana is dry, it must again be subjected to a visual selection process, carefully removing any cascara that show signs of mold, those with diseases that were not separated in the first selection, and any other foreign objects such as seeds or fruit that are mixed with the cascara.



DRYING SULTANA



DRYING IN THE SHADOW - SULTANA







## 4.8 SULTANA ROASTING

This process is usually not carried out by the producers, but is instead performed by the consumers or the entrepreneurs that create added value, e.g. sultana infusion, infusions mixtures, sultana flour, etc. Traditionally, sultana was roasted in clay pots to intensify the color and flavour before preparing the tea, but nowadays it is roasted in frying pans or in electric ovens if greater quantities are required. Depending on the taste or intended purpose, the roasting can be light (for traditional tea) or more intense (to transform it into sultana flour).

In the markets of Caranavi and the city of La Paz most of the sultana that is for sale is not roasted. It is important to note that this process can degrade several desirable chemical components. Proteins, sugars and phenolic compounds (chlorogenic acids, caffeic acid and protocatechic acid), are degraded because they do not tolerate high temperatures<sup>8</sup>. Only caffeine is thermally stable, which means that it does not degrade during roasting<sup>8</sup>.



## 5. PRICES

As with coffee, the production of the sultana can be conventional or organic. It is important to take into account that the pesticides used in the conventional system are applied directly to the coffee cherries. Therefore, consuming sultana from a conventional system is even more toxic than the coffee it was part of. The price of the unroasted sultana in the region of Caranavi varies, generally the quintal (46 kg) is sold for 120 BOB, but a better quality sultana that comes with the guarantee of being organic can be sold for up to 200 BOB.

In the popular markets of the city of La Paz, sultana mainly comes from Caranavi, Taipiplaya, Coroico and Chulumani. The price can vary according to the place of origin or if further processing has been performed (Table I). It should be noted that the cultivation system and how these sultana products were treated is unknown.

**Table I.** Price comparison of the sultana in the popular markets of the city of La Paz

MARKET	SELLER	QUANTITY	PRICE (Bs)	COMMENTS
Rodríguez	First	Quarter pound	2	Unroasted sultana from Coroico
		One pound	8	
	Second	Quarter pound	2.5	Unroasted sultana from Coroico
		One Pound	8	
	Third	Quarter pound	2.5	Sultana from Taipiplaya – Caranavi, roasted mixed with dried orange peel pieces and sugar
		Half a pound	8	

Santa Cruz and Illampu	First	Half a Pound	5	Sultana from Coroico, roasted with sugar
		One Pound	9	
	Second	Quarter pound	2.5	Sultana from Caranavi, unroasted
		Half a pound	5	
Tambo de coca ADEPCOCA	First	One pound	4	Sultana from Chulumani, unroasted
	Second	One pound	5	Sultana from Chulumani, unroasted

**Source:** Own elaboration. Data obtained in January 2019

In addition to popular markets, sultanas can also be found in organic stores and at organic product fairs. This sultana has a higher price due to it having been handled more carefully and its ecological characteristics (Table 2).

**Table 2:** Price comparison of ecological sultana in the city of La Paz

COMPANY	QUANTITY	PRICE (Bs)	COMMENTS
Café Ponci	Quarter pound	5	Organic sultana, unroasted
Café Munaipata	150 (g)	30	Organic sultana, unroasted, high selection quality
Sultana té	150 (g)	20	Organic sultana, slightly roasted with dried orange peel and cinammon

**Source:** Own elaboration. Data obtained in January 2019

## 6. NUTRITIONAL VALUE

Sultana has several nutritional components, such as carbohydrates, proteins and minerals. As for the organic compounds, it contains appreciable amounts of tannins, phenolic compounds (such as: chlorogenic acids, protocatechuic acid and caffeic acid), caffeine and several amino acids<sup>6-9</sup> (Table 3). Nutritional analysis also was carried out on sultana flour showed that it contains quantities of calcium (541.73 mg in 100 grams).

**Table 3.** Chemical composition of the sultana

COMPONENT	% DRY BASE [MG/G] <sup>(A)</sup>	% DRY BASE [MG/G] <sup>(B)</sup>
Tannins	3 ± 5	-
Caffeine	1.5 ± 1.0	0.55-35.68
Chlorogenic acid	2.4 ± 1.0	0.04-17.06
Total caffeic acid	1.6 ± 1.0	-
Protocatechuic acid	-	0.32-9.25
Total fiber	60.5 ± 2.9	-

**Source:** Murthy & Naidu 2012 <sup>(a)</sup>; Pacheco y compañía 2018 <sup>(b)</sup>

These phenolic compounds, mainly chlorogenic acids, have antioxidant properties, i.e. they neutralize excess free radicals and prevent cell damage by contributing to the prevention of diseases that are related to cell degeneration<sup>10</sup>. They also have antimicrobial<sup>10</sup> activity, have nutraceutical properties (of natural origin, with positive effect on health, greater than that a normal food could have), are hepatoprotective (help protect the liver from external agents and ensure its proper functioning), are hypoglycemic (help normalize low blood

glucose levels) and have antiviral<sup>7</sup> activity. The coffee pulp, besides containing large quantities of phenols, is a product that is very rich in fiber, All of those characteristics make this product an important nutritional supplement<sup>6</sup>.

Other phenolic compounds, such as protocatechnic acid, are also antioxidant, reduce glucose levels, are anti-inflammatory, antibacterial and have neurological effects that mainly counteract Alzheimer's disease<sup>11-12</sup>. Finally, caffeine, a well-known alkaloid, has anti-drowsiness, energizing, antioxidant, diuretic and digestive properties<sup>13</sup>. However, although cascara has energetic properties, the caffeine content is lower than that of coffee, an important consideration for people sensitive to caffeine<sup>7</sup>.

## 7. OTHER APPLICATIONS

Cascara cannot be used directly for animal feed due to the anti-physiological and anti-nutritional factors present in it, mainly as a result the tannins, phenolic compounds and caffeine<sup>14-19</sup>.contained in it. These compounds cause reduced consumption of food and absorption of nutrients, limiting its application as animal feed<sup>14-19</sup>. However, using sultana for less than 10% of an animals' diet has been shown not to cause these anti-nutritional effects.<sup>15</sup>.

These compounds can also be harmful to the environment if applied directly to the soil, but if they are treated this harm can be minimized. Some of the methods that were evaluated for reducing these compounds are hot water treatment, microbial biodegradation and aerobic fermentation<sup>16</sup>

By means of these techniques, the production of bioproducts such as forage, biogas, mushroom culture, ethanol culture, vinegar, biopesticides and probiotics.<sup>17</sup>

Recently, this waste has been used with good results in composting and vermicomposting; the humus produced by the sultana is a good organic compost and a good medium for growing plants <sup>18</sup>.

## 8. CONCLUSIONS

Because market interest is growing and demand for sultana is increasing, it is becoming an important complementary product for coffee growing families. What was once thought of as a poor man's tea is now a product that is linked to La Paz's identity and a gourmet trend. The people of La Paz are the main consumers of this product that was previously only found in markets. Today, it can be consumed in many different ways in well-known coffee shops throughout the city. Its preparation is not limited to the traditional tea, but also includes various innovations in gastronomy, as can be seen in the recipe book presented as part of this project.

In the development of this manual we have verified the emergence of a sultana value chain, in which new actors are adding value to the cascara, creating innovations from the sultana such as flour, filter teas and infusion mixtures, etc., By developing new ways of enjoying sultana and incorporating them in the menus of cafes, restaurants and hotels, a still unsatisfied dream, for quality sultana is being generated.

Currently, several coffee families have reported an increase in demand for sultana, and recognize the contribution it makes to their income. As a result, they are devoting more effort to improving sultana quality.

This document aims to contribute to the process of changing how people see this waste and adding value to it, so that the coffee growers can develop new income opportunities from this valuable product as consumption continues to grow.



## 9. ACKNOWLEDGEMENTS

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Last but not least, we would like to thank Sofia Bohorquez, the “Coffee Pulp Flour” entrepreneur, who provided us with information about the processing of sultana and flour production.

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Zürcher Hochschule  
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